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7. (Original) The diode as defined by claim 6, and further including a plurality of gate electrodes, channel regions, first doped regions, and second doped regions all within a guard ring.

8. (Currently amended) A method of fabricating a semiconductor diode in a semiconductor body having current flow vertically from one major surface with reduced reverse bias leakage current to another major surface comprising the steps of:

a) providing a semiconductor body of one conductivity type,

b) forming at least one gate electrode on a gate insulator on one surface of the body,

c) forming a doped channel region of a second conductivity type in the first surface of the substrate underlying all of the gate electrode,

d) forming a first doped region of the second conductivity type within the body contiguous with the channel region and deeper in the substrate than the channel region and under a peripheral region of the gate electrode,

e) forming a second doped region of the first conductivity type in the first surface on the body and abutting the channel region and adjacent to the gate electrode,

f) forming a first electrode on the first surface in ohmic contact with the second doped region and the gate electrode, and

g) forming a second electrode on a second surface of the substrate opposite from the first surface,

whereby an inversion region extends through the channel region and electrically connects the first electrode and the second electrode through the second doped region, the inversion region, and the body when the gate electrode is forward biased, the channel region underlying all of the gate electrode providing reduced reverse bias leakage current between the first electrode and the second electrode, and the first doped region defines a vertical current path from the inversion region into the semiconductor body under the gate electrode between the first electrode and the second electrode.

9. (Original) The method as defined by claim 8 wherein step a) includes providing a body comprising an N+ doped substrate and an N- epitaxial layer, the epitaxial layer providing the first surface of the body.

10. (Original) The method as defined by claim 9 wherein the N+ substrate has a dopant concentration on the order of 1E18-1E21 atoms/cm^3, the N- epitaxial layer has a dopant concentration on the order of 1E13-1E17 atoms/cm^3, the first doped region has a dopant concentration on the order of 1E14-1E19 atoms/cm^3, the second doped region has a dopant concentration on the order of 1E14-1E19 atoms/cm^3, and the channel region has a dopant concentration on the order of 1E14-1E19 atoms/cm^3.

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7. (Currently Amended) A semiconductor optical device comprising:

a semiconductor substrate;

a stacked body formed at least by a cladding layer having a first conductivity, an active region formed by an active layer or a photoabsorption layer and a cladding layer having a second conductivity, said stacked body being provided on said semiconductor substrate and formed like a mesa stripe;

wherein both sides of said stacked body are buried by a burying layer formed at least by a semi-insulating semiconductor crystal;

the width of said active region is smaller than any of the width of said cladding layers having said first conductivity and the width of said cladding layer having said second conductivity ~~of said stacked body~~; and

a Ru-doped semi-insulating layer is provided in a space between said burying layer and said active region in both sides of said active region.

8. (Original) The semiconductor optical device as claimed in claim 7, wherein said Ru-doped semi-insulating layer is Ru-doped InP formed by using mass transport.

9. (Currently Amended) The semiconductor optical device as claimed in claim 7, wherein a Ru-doped semi-insulating layer is provided as said burying layer by epitaxial growth method such that said Ru-doped semi-insulating layer provided as said burying layer covers said Ru-doped semi-insulating layer provided in said space.

10. (Original) The semiconductor optical device as claimed in claim 9, wherein composition of said Ru-doped semi-insulating layer provided by said epitaxial growth method is Ru-doped InP or Ru-doped InAlAs or Ru-doped InGaAlAs.